HOARE LEA

# Air Studios.
# London.
# Bright Space .

**MEP ENGINEERING**
PLANNING REPORT

REVISION P1 – 12 DECEMBER 2019

## Audit sheet.

| Rev. | Date | Description of change / purpose of issue | Prepared | Reviewed | Authorised |
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| P1 | 12/12/2019 | Preliminary Issue | NL | RK | |
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# Contents.

# 1. Introduction

This report has been produced to outline our proposals for modifying the mechanical, electrical and public health (MEP) systems to serve AIR Studios, Hampstead, London.

The intention of this report is to outline the early stage considerations to help develop the brief, to inform the cost plan and to provide sufficient information to support the planning application.

Layout drawings for the MEP services have been produced and are appended to this report.

Air Studios is located within Lyndhurst Hall, a Grade II listed congregational church with church hall to the rear, designed by Alfred Waterhouse in 1883-4. The studios require updating of their facilities, particularly communal areas, including increased and relocated toilet provision.

Figure 1 - AIR Studios within Lyndhurst Hall

# 2. Existing Services

AIR Studios is currently provided with the following MEP services:

## 2.1 Heating

Heating is provided by a central low temperature hot water (LTHW) heating system fed by gas-fired boilers, located within the basement, and serving various heat emitters, such as radiators, underfloor heating and heater batteries.

Figure 2 - Existing boilers located in the basement

## 2.2 Cooling

Cooling is provided by a central chilled water cooling system fed by 2 no. refrigerant, condenser-less chillers, located in the basement, with condensers located on the roof. One of the chillers was originally installed in 1992 and used refrigerant R22, but was converted in 2015 to use R438A. The second chiller was installed in 2018 and uses refrigerant R410A. The chilled water system serves air handling units (AHUs) and fan coil units (FCUs) via a chilled water buffer vessel.


Figure 3 – 2 no. chillers and buffer vessel located in the basement.

## 2.3 Ventilation

Ventilation is provided to the WCs by local independent ventilation systems installed within plant rooms or bulkheads, as identified on the drawings.

Both the ground floor and first floor kitchen are provided with kitchen ventilation systems.

Figure 4 - Kitchen extract hood

Figure 5 - WC ventilation located in first floor plant room

## 2.4 Domestic Services

Cold water is provided by a central cold water system with hot water provided by a small central system and some point of use electric water heaters.

### 2.5 Electrical

- The main electrical supply to the building is derived from 2 No 400 Amp 3 phase incomers with LV distribution split largely across incomer 1 and incomer 2 which serve the existing chapel site and cottage/foyer.
- Incoming telecoms are in place with data and VOIP presented in a central hub cabinet. Horizontal cabling is then distributed throughout the building via a number of satellite hubs.
- Due to the listed status and nature of the existing building fabric, primary LV and data cabling routes are fragmented. The proposed scheme looks to maintain the existing distribution board locations where possible to avoid rerouting sub-main cabling routes. Where necessary these distribution boards will be replaced. From these key locations new containment and wiring will be coordinated within the new scheme.
- We are not envisaging any works to the existing lighting protection system at this stage, but any new roof mounted plant or equipment will be locally bonded where necessary following completion of a risk assessment.
- The majority of works will involve new wiring installations but where existing cabling is maintained these circuits will be re-tested and reconnected.
- It is proposed that the sites existing fire alarm and intruder alarm system head end equipment will be maintained. New wiring and compatible devices will be interfaced and extended from these locations.

## 3. Mechanical Proposals

### 3.1 Ventilation

Building Regulation Part F states that all occupied areas must be provided with 10 litres / second / person of fresh air and that WC areas are provided with at least 5 air changes per hour. This can be provided through natural ventilation, such as opening windows, or mechanical ventilation systems.

We recommend the following strategies for the refurbished areas:

#### Ground Floor Female Toilet

The existing ventilation system serving this area should be stripped out and replaced with new, with new ducting following the previous duct routes and penetrations to outside. The fan unit can be located in the existing plant area on first floor, directly above.

#### Ground Floor Male Toilet

The existing ventilation system serving this area should be stripped out and replaced with new, with new ducting following the previous duct routes and penetrations to outside. The fan unit can be located wthin a high level bulkhead, as per the existing installation.

#### Ground Floor Proposed Office Areas

A new mechanical ventilation heat recovery (MVHR) system should be provided to serve the office, accounts office and meeting office, sized to provide, as a minimum, 10 litres / second / person.

The new fresh air and exhaust air ducting could reuse the previous duct route of the ground floor kitchen ventilation system, which is to be removed, terminating above the roof of the male WC with weather cowls.

Internally ducting will run within the ceiling void above the offices to connect onto grilles located within the ceiling.

#### First Floor Meeting Room

A new mechanical ventilation heat recovery (MVHR) system is to be provided, sized to achieve, as a minimum, 10 litres / second / person. The new ducts could follow the routes of the previous ground floor office system which is to be stripped out.

#### Small Dining Area and Servery

A new mechanical ventilation heat recovery (MVHR) system is to be provided, sized to achieve, as a minimum, 10 litres / second / person. The new ducts could follow the routes of the previous ground floor ventilation system which rises to the roof above.

Air should be provided to the dining area and extracted from the servery. As the servery is likely to produce steam from drink making equipment the heat exchanger of the MVHR is to be of a suitable material that will not deteriorate from steam laden air.

#### Wash-up Area

The wash-up area is to be provided with a new through the wall extract fan in place of existing. This is to be sized to remove steam from the dishwasher system.

#### Large Dining Area

For the large dining area we have made two proposals:

- Option 1 is to provide natural ventilation via opening windows
- Option 2 is to provide mechanical ventilation through an externally mounted air handling unit (AHU) that will ventilate, heat and cool the space with a decorative air sock provided at high level for distribution.

Due to the occupancy of this room (46 people) 460 litres / second of fresh air is to be provided for compliance with Part F. This is a large volume meaning that providing this via mechanical ventilation will require reasonably large plant, which will require planning consent, will generate noise and will require ongoing maintenance. A preliminary selection has been obtained from a supplier for a unit that is 1700mm x 1100mm x 1400mm high, weighing 360 kg and generating 53 dB (A) of break out noise.

Providing this fresh air rate by natural ventilation through opening windows means that no additional external plant is required to serve this area. However, as the fresh air is untreated, it enters the space at the external ambient temperature which could cause thermal comfort issues and impose additional load on the heating and cooling plant.

Figure 6 – Ventilation air sock provided within the Bodleian Library

### 3.2 Cooling

Thermal modelling has been carried out for the building to inform the cooling and ventilation strategy. The findings of this are outlined in the Hoare Lea report REP-3103420-08-JT-20191210 *Air Studios Overheating Analysis*. Essentially, active cooling is required in most spaces to comply with the recommendations of CIBSE guide A, that no room be above 26°C for more than 3% of the year.

Some of the rooms were found to exceed this guideline by a small amount, therefore the client may want to consider if they are willing to accept the estimated conditions and not provide active cooling, which would reduce capital costs, running costs and maintenance costs.

The percentage of occupied hours in exceedance of 26°C and the peak temperature have been provided for each space listed below to allow the client to make an informed decision.

Our recommended strategy of providing cooling to each space is also listed below. This would be designed to achieve compliance with CIBSE guide A: all areas would be designed to have a peak internal temperature of 26°C when the external ambient temperature is at its highest.

### Ground Floor Office

Hours of exceedance above 26°C: 4.8%
Peak internal temperature: 30.32 °C

If cooling is to be provided, we recommend this is achieved by adding a cooling coil on the ventilation supply air duct to reduce the temperature of the fresh air and provide cooling to the space. This will be fed by the existing chilled water system with a three-port valve provided to modulate the temperature and maintain the temperature.

### Ground Floor Accounts Office

Hours of exceedance above 26°C: 3.3%
Peak internal temperature: 29.45 °C

If cooling is to be provided, we recommend this is achieved by adding a cooling coil on the ventilation supply air duct to reduce the temperature of the fresh air and provide cooling to the space. This will be fed by the existing chilled water system with a three-port valve provided to modulate the temperature and maintain the temperature.

### Ground Floor Meeting Office

The ground floor meeting room was estimated to spend only 2.4% of the year above 26°C, meaning active cooling does not need to be provided to comply CIBSE guide A.

Hours of exceedance above 26°C: 2.4%
Peak internal temperature: 29.24 °C

If cooling is to be provided, we recommend this is achieved by adding a cooling coil on the ventilation supply air duct to reduce the temperature of the fresh air and provide cooling to the space. This will be fed by the existing chilled water system with a three-port valve provided to modulate the temperature and maintain the temperature.

### First Floor Meeting Room

Hours of exceedance above 26°C: 5.2%
Peak internal temperature: 31.38 °C

We recommend that the existing vertical fan coil units be replaced with new 4-pipe heating and cooling fan coil unit served by the existing chilled water system and low temperature hot water heating system.

### First Floor Small Dining Area

Hours of exceedance above 26°C: 4.2%
Peak internal temperature: 27.06 °C

If cooling is to be provided, we recommend this is achieved by adding a cooling coil on the ventilation supply air duct to reduce the temperature of the fresh air and provide cooling to the space. This will be fed by the existing chilled water system with a three-port valve provided to modulate the temperature and maintain the temperature.

### Large Dining Area

The thermal modelling identified that active cooling would be required to the large dining area if either mechanical or natural ventilation are provided.

In option 1, where natural ventilation is provided, we recommend this achieved through wall mounted fan coil units fed by the existing chilled water system. These would provide cooling only with ventilation through the opening windows.

In option 2, where mechanical ventilation is provided, we recommend that cooling is achieved by providing an AHU with a cooling coil fed by the existing chilled water system that reduces the temperature of the fresh air to provide cooling.

## 3.3 Heating

Generally, we recommend that in refurbished rooms existing radiators are removed with flow and return connections left to serve new radiators provided as part of the refurbishment. Some radiators will need to be stripped out completely to facilitate the proposed works. The flow and return connections are to be stripped back to the next live point and capped.

All new radiators will be sized to meet the estimated heat loss from the space served and should be steel panel radiators provided with thermostatic radiator valves (TRVs).

Many of the existing radiators within the buildings have not been provided with any form of control. We recommend that new TRVs are provided on all existing radiators as part of the project. A schedule of existing radiators taken from the operation and maintenance manual available on site has been provided as an appendix to this report.

Within the large dining area for option 1 we recommend that radiators are provided beneath windows to heat the incoming natural ventilation fresh air in periods of low external ambient temperatures.

## 3.4 Hot and Cold Water

As part of the strip out works, hot and cold water supplies within WC areas and kitchen are to be stripped back to the incoming point / perimeter, ready for reuse to serve the new layout.

Any services that are redundant, such as within the ground floor kitchen, are to be stripped out completely back to the next live point and capped.

## 3.5 Drainage

Similarly, to hot and cold water, existing drainage is to be stripped out back to a suitable point ready for reuse to suit the new layout.

## 3.6 Kitchen

The ground floor kitchen is to be refurbished into an office space. As  such, all existing services provide for the kitchen, such as ventilation, hot and cold water, drainage and gas supply, are to be stripped out completely. All redundant services will be stripped out completely with the building fabric made good accordingly. Hot and cold water, gas and drainage will be stripped out back to the next live point and capped. No dead legs of any services will be left.

The first floor kitchen ventilation system is to be stripped out and replaced with new to suit the refurbished kitchen layout, as detailed by the kitchen specialist, Space Group. The new kitchen plant is to be sized to meet the requirements of DW172 2018 - *Specification for Kitchen Ventilation Systems.*

Gas pipework is to be extended from existing capped at the perimeter to serve all new outlets. A gas safety system is to be provided to meet the requirements of IGEM/UP/19, *Gas interlock systems.*

Hot and cold water services are to be provided to suit the new kitchen design. Point of use water heaters will be provided as necessary where existing have been removed.

New grease traps will need to be provided on new drainage outlets as required by the kitchen specialist before connection onto the existing above ground drainage network.

# 4. Electrical Systems

## Low voltage (LV) Distribution

At present the site is split into two main areas, the main hall and cottage, which are separated via the existing single-story foyer with ground floor areas currently served from 3 main distribution boards.

Distribution board 16 which is fed from incomer 2 acts as the main feed to the cottage, it is currently situated adjacent to the main reception within a cupboard at low level under the stairs. In addition to supplying local lighting and small power, this distribution also sub-feeds distribution boards 13, 14 & 18. It is proposed that this distribution board will be replaced but that the existing sub-main cabling will be re-tested and retained.

Distribution boards 13 & 14 are currently located adjacent to one another in the ground floor kitchen area and serve localised power and lighting to the reception, CCTV/Gates and male WC's. As part of the new scheme this area will be remodelled with both distribution boards removed. The existing sub-main feed to distribution board 13 will be re-tested/retained and a new distribution board provided in the same location which will serve the newly refurbished reception and male WC's but also the repurposed office areas, foyer and corridor areas.

Distribution board 18 is currently located in the kitchen on the first floor, this distribution board will be replaced and retained in its current location to serve the new first floor kitchen, office and dining areas. Distribution board 18 is also currently providing a feed to the mechanical heat rejection units situated above the green room, this sub-main route will clash with the installation of the new mezzanine floor so feeds to these units will be replaced and fed from a new mechanical distribution board on the first floor.

Distribution boards 10 & 11 which are fed from incomer 1 via distribution board A/1 are in a small wall void adjacent to the main hall door way, they currently serve the existing female WC's, DDA WC and green room. The majority of existing wiring from these distribution boards is mineral insulated which is very difficult to manipulate so we are proposing that these locations and boards are retained. Cabling for the new female and client WC installation will be fed from these locations.

As aforementioned the existing heat rejection units are currently fed from distribution board 18 although other supporting elements of the heating/cooling systems are fed from alternative distribution boards. This presents a risk to the testing and commissioning of the installation given that the mechanical installation needs to be safely isolated in numerous locations. Furthermore, the resilience of the mechanical cooling systems are critical to the operation of the studio, we also identified that the sub-main route feeding the heat rejection units is clipped to the existing façade and will impede the new mezzanine installation.

Notwithstanding the previous points made the 1st floor dining areas will need additional plant and therefore we are proposing to install a dedicated mechanical services distribution board situated adjacent to the existing BMS control panel within the green room plant area. This will alleviate the need for us to run cabling for mechanical supplies across the new 1st floor dining area, free up spare capacity for new kitchen equipment on distribution board 18 and but essentially provide a single point of isolation for the heat rejection plant and capacity for new mechanical services serving the first floor.

To feed this new distribution board a new 100 Amp switch fuse will be provided to the existing basement intake bus-bar and a new sub-main cable will rerouted through the existing ground floor plant room into the green room plant room directly above. The riser will consist of a 50mm core drill with cabling clipped direct to the building fabric.

The existing sub-main cabling feeding distribution boards 13,16 & 18 will be re-tested and retained where feasible, but this route may need to be evaluated following the strip out works or results of testing.

## Assumed Diversified Maximum Demand (ADMD) Calculation

An approximate Electrical Load Assessment has been carried out for the installation indicating the anticipated Maximum Demand for the refurbishment works. This has been carried out using the BSRIA "Rule of Thumb" Guidance. This has considered the gross floor areas of the building, the additional small power, lighting mechanical plant and kitchen equipment but also allows for removal of the ground floor kitchen loads and re-feeding of mechanical heat rejection plant.

Overall the ground floor small power and lighting to foyer, reception and WC's is a 'like for like' comparison of the existing installation, the new offices will also demand less than the present kitchen installation, we therefore see no concerns with the loads on the distribution board 13 and 16 sub-main feeds providing the existing installation is compliant with BS7671 guidelines.

Similarly, distribution board 18 will be adequate to serve the 1st floor kitchen and dining areas with new kitchen equipment loads which are primarily the new dishwasher, combi oven and fryer being on the whole offset by the removal of the mechanical heat rejection plant loads.

These loads will need to be checked and reviewed following receipt of final kitchen design plans and will be subject to distribution board 18's existing sub-main being compliant with BS7671 guidelines

## Resilience of Service

No additional resilience has been provided to the LV building supply or local distribution infrastructure.

## General Power

In general, new power supplies will be provided throughout the ground and first floor areas wired in LSX flexible cable mounted on baskets where feasible or clipped direct. Having discussed this in more detail with the client flexibility and accessibility is a priority. Cabling routes in F.O.H areas will need to be coordinated and concealed but areas such as the offices, reception and B.O.H areas will be provided with a more accessible system which will allow the client access if spaces are repurposed in the future without having to disturb the building fabric.

To provide this flexibility we would look to install cable baskets above all accessible ceilings, provide plastic conduit drops to all sockets and allow for surface skirting or dada trunking with offices and back of house areas. Where cabling is installed in F.O.H areas for example within joinery or structure, where possible we would look to coordinate removable access facias or plates.

There are also numerous existing cabling routes under the existing foyer floor, these duct routes connect the reception, new staff room area (main riser) and electrical cupboard and where possible we will look to maintain and reuse these routes.

## Small Power Installations

New small power wiring and outlets will be installed to all core and circulation areas for general, maintenance and cleaning purposes. Finishes of all sockets will be agreed with the architect.

New power supplies will be provided to all kitchen equipment with certain items requiring dedicated supplies. These will be coordinated and designed with the catering consultant at the next stage.

Small power outlets will be provided at roof level principally for cleaning/window washing by means of weatherproof IP65 surface mounted sockets.

Cleaner's sockets will be provided to all areas and clearly engraved.

## Mechanical Power

New power supplies will be provided to ventilation, heating and cooling plant. Ground floor office and male WC ventilation will be fed from distribution board 13 with all first-floor plant fed from the dedicated mechanical distribution board situated in the green room plant room. Ground floor main door air curtain will also be fed from the mechanical distribution board.

## General Lighting

The complete lighting installation will need to comply with the requirements set out in the Code for Interior Lighting published by the Chartered Institution of Building Services Engineers (CIBSE), Building Regulations and relevant CIBSE Technical Memoranda.

The lighting system and luminaires will be designed at the next stage but should seek to provide the following average maintained luminance levels:

Design Criteria General Lighting Levels

| Area | Average Luminance |
|---|---|
| Office area | 350 - 400 lux |
| Reception | 300 lux |
| Circulation | 150 lux |
| Stores | 100 lux |
| Maintenance | 300 lux |
| Toilets | 150 lux |
| Corridors | 150 lux |

Appended to this report are lighting treatment plans which highlight each of the key areas and the proposed scope of works which are summarised as follows:

### Offices/Meeting Rooms/Reception

The office lighting design will incorporate direct LED fittings installed into a traditional dropped false ceiling layout suspended from the building structure. The lighting will be controlled from manually operated wall mounted light switches. Ceiling mounted PIR's should be considered which can be interfaced with the manual controls to provide absence detection which, during periods of inactivity will dim or switch off the lighting for maximising energy savings. It is not proposed to provide any daylight linking to the ground floor offices given they have minimal exposure to external daylighting due to the external foliage adjacent to the cottage. Similarly, the reception area will be provided with functional lighting, but this will be largely influenced by the architectural design and ceilings. If a suspended ceiling is provided, then down lights maybe more appropriate than 600 x 600 lay in modules but feature lighting could be provided over the counter and alternatively pendant/suspended luminaries could be used if no ceiling was provided.

### WC's

Male, female and client WC's will be provided with new LED down lighting or wall mounted luminaires, these will be PIR controlled.

### Foyer

New lighting to the ground floor foyer area will be subject to a coordinated architectural design at the next stage, whilst we are looking to explore the use of natural daylighting from the 1st floor via light troughs at the perimeter the foyer will form the main entrance to the studio and will also need to function at night and during reduced natural light levels.

Furthermore, the foyer is a key area and must present a "Sense of arrival" and as such a bespoke and considered lighting scheme will be needed, following initial discussions with the design team we envisage floor mounted LED lighting accentuating the existing building architecture with linear or decorative luminaires coordinated within the new mezzanine ceiling. The existing foyer area currently has wall mounted luminaires which we are looking to remove.

Controls to this area are to yet to be defined, although we would recommend groups of fittings (for example: floor, ceiling, decorative/feature) are combined on dedicated channels which would allow each to be dimmed enabling the balance and affect to be controlled.

Whilst this could easily be achieved using manual switching via plate mounted rotary dimmers as the design develops it may be sensible to adopt a simple control interface which could be programmed to accommodate simple scene setting.

### Circulation/Staff Areas

Circulation areas (corridors, stair cases and staff areas) lighting will generally be provided by means of recessed/wall mounted LED luminaires coordinated with the architect, certainly in newly refurbished areas such as the staircase accessed from ground floor foyer to 1st floor dining room entrance, but the scope of other existing staircases and passage ways needs to be agreed. It maybe we replace the existing luminaires or look to clean and re-lamp.

### External Areas/Plant Rooms

The main entrance also serves as a sense of arrival and it's our understanding that the existing façade lighting needs to be replaced or repaired, similarly the lighting to the rear fire escape stair will need to be replaced.

External lighting will be photo cell/timeclock controlled with local override switching.

Back of house / plant / roof areas will be provided with modular 'batten type' LED luminaires with ingress protection as appropriate and high frequency control gear.

### Kitchen/Food Store

The kitchen areas will be provided with 600 x 600 LED modules situated within a suspended ceiling grid, lighting will be manually switched with IP 44 rated luminaires to protect from damp ingress and condensation from steam. They will be selected for easy cleaning and EHO compliance.

### Servery/1st Floor Dining Areas

The servery/dining area and 1st floor multifunction area above the foyer will follow a similar approach to the ground floor. Natural daylighting will form a much larger role, but a decorative/feature lighting scheme will be developed with the possibility of localised automated controls with pre-set scene controls providing maximum flexibility for this multi-purpose space.

The servery and adjacent dining area will look to maximise the height of the space with roof and existing structures exposed, luminaires in this area will likely be decorative pendants with feature lighting incorporated into the joinery and highlighting architecture.

Careful consideration will be given to the mezzanine dining area due to the construction of the glazed atrium, during the day the area will benefit from natural daylight, but artificial lighting will be required for late afternoon, evening functions. We understand that the priority use of this space will be dining but that the client would like the flexibility to use this space for other formal functions. Notwithstanding pendant feature lighting we envisage coordinating slim line LED linear luminaires into the glazed atrium structure to provide a high uniform light level for formal functions, but we would also recommend considering floor mounted luminaires and/or indirect lighting for events that require a less formal lower lighting level. All fittings will be carefully selected to avoid light pollution to surrounding areas.

**Cabling Routes**

Where ceilings are provided FP200 cabling will be laid upon basket and clipped direct, areas where cabling cannot be easily concealed we will coordinate routes with the architect through new structures and joinery. Where high level exposed wiring cannot be avoided we will follow existing structure and select white or mineral insulated copper cabling which will be neatly clipped.

Emergency Lighting

The emergency lighting shall ensure that in the event of power loss to the building there is a back-up supply in place to the luminaires which cover the escape routes. The emergency lighting shall provide illumination of a minimum of 1lux to all exit routes in the building.

Design Criteria

Emergency lighting will be provided to all areas via dedicated LED fittings with 3 hour battery packs, to enable safe egress from the building. All emergency luminaires with be provided with integral battery packs. All luminaires will have a green LED indicator lamp to indicate a healthy battery supply.

Emergency Lighting and general egress lighting will be provided to all exits from the Building.

All exit/escape signage will be designed by the Architect to cover all escape routes and final exits, emergency luminaires will be located adjacent or in close proximity to each sign to ensure adequate illumination of the sign.

The emergency lighting systems to tenant areas will tested via local manual operated emergency key switches in risers the tenant will be responsible for ensuring emergency lighting will go through an annual full discharge and recharge test.

The emergency lighting systems to landlord areas will be provided with automatic integral test facility ensuring emergency lighting will go through an automatic annual full discharge and recharge test. Simple interface will be provide to the reception desk advising of any failures.

The building has assumed a self-contained solution to power the emergency lighting rather than a central battery in order to avoid the cost and spatial requirements of a central battery system.

**Ancillary Services**

**Building Security Access Control**

Building security systems and operations will be monitored and controlled from the Reception Desk on the Ground Floor. The final details of how access control will allow staff and public access will be further developed at the next stage of the design review although it was confirmed that the site has 24hr manned security. At present the client has advised that access control to areas may prohibit free flow for staff and clients and that not proving access control does not pose a concern.

**Disabled WC Alarms**

This is to provide disabled persons alarm systems in all disabled persons toilets, showers and changing facilities providing local alarm/reassurance beacons with external reset button and remote visible and audible indication of alarm. Alarms will be relayed to an annunciation panel located within the Main Reception.

The final operation and signalling of this system will be further developed during the next stage of design review.

**Intruder Alarms**

The site does have an existing intruder alarm system which is linked to the CCTV system. At present no further works are envisaged as perimeter doors are already covered. The new front entrance door will require new contacts and it proposed that the existing wiring can be reused. Due to the extent of strip out works existing alarm cabling will need to be identified or allowances made to replace if deemed necessary.

The detail of the intruder alarm system requires further development at the next stage of design review.

**Fire Detection Alarm**

An analogue addressable fire detection and voice alarm evacuation system designed in accordance with BS5839-1:2013 to Category L1 – Protection of Life will be installed.

The fire detection system will be installed to meet the requirement of the Design Codes, Disabled Discrimination Act (DDA) and Building Control. The existing main indication and control panel is located in the Main Entrance/Reception and its deemed suitable for reuse.

The base build system will consist of manual call points, automatic smoke/heat detectors, interface units and central control/indicator panels. Interface units will be provided to link lighting, plant, kitchen and automated exist doors.

Where exposed services are required (1st floor dining areas and foyer) careful consideration will be given to wiring routes concealed where possible, the use of wireless detectors could also be considered.

The final detail of the Fire Alarm system is to be further developed during the next stage of design review.

CCTV

The site currently operates a VOIP CCTV system, new data points will be provided at high level in key areas for new CCTV cameras. The CCTV cameras will be procured and installed by the client's specialist.

The CCTV system final design is to be developed during the next stage of design review.

Aerial Pager and "Man Down" System

The client currently operates an aerial pager and "man down" system. The head end equipment is currently installed within the reception with amplifiers in the 1st floor tape room. This equipment will be retained but the external aerial currently situated neat the new 1st floor dining area penetration will need to be relocated.

The reception area also contains the existing BMS control panel which is currently wall mounted, this panel will also be retained.

**Earthing and Bonding**

The purpose of an earthing and bonding system is to provide a system for the transfer of electrical current to earth so that in the event of an earth fault, all earth fault currents are safely conducted to earth without danger to personnel or damage to equipment.

**Design Criteria**

The earthing and bonding system will provide main and supplementary bonding in accordance with BS 7671 Amendment 3, to create an equipotential zone of protection within all areas supplied by the associated electrical system, to ensure that all exposed conductive parts are at the same electrical potential as earth, and that personnel are not exposed to unsafe potentials under steady state or fault conditions.

The client currently operates a ‘clean’ earth system for connection of specialist equipment. The new earthing scheme will largely follow the existing strategy, but careful consideration will be given to any new connections to ensure unnecessary ‘noise’ interference is avoided.

A high integrity earth will be provided to offices where required in accordance with IET Regulations.

**EMI Suppression and Surge Protection**

Transient over voltage protection units will be installed to help protect sensitive electrical and electronic equipment from the effects of a lightning strike or mains borne spikes from sources external to the building.

Protection units will be installed within LV distribution switchboards and Landlords distribution boards serving sensitive electronic equipment. (e.g. Security/BMS/Fire Command Centre). Exact locations are subject to design development.

## Communication Cabling

The site is already provided with a central hub unit and converged data network which hosts telephone, video and data. The main hub is situated in the basement with the network interlinked via a number of satellite hubs throughout the building.

A new data cabinet will be provided on the ground floor to provide a hub for the reception, offices, foyer and first floor but also to provide future flexibility should the client wish to repurpose areas.

Cat 6 data points will be provided to the following:

- Twin point per desk station
- Each room/area will have a point at high level for WIFI (Equipment by clients specialist)
- Single point for remote VOIP phones
- High level points for networked CCTV
- Kitchen and point of sale devices.
- A number of additional points to be agreed to provide future flexibility

**Telecom/Data Cable Containment**

A system of galvanised cable basket where feasible or strap supports will be installed to provide cable containment, with final runs within conduits or skirting/dado trunking.

**Analogue Lines**

At this stage there is no requirement for any additional analogue lines.

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